

Patent Application No. 09/548,141

IN THE CLAIMS:

Claim 1 (previously amended) A method for classifying a data packet, the method comprising:

receiving the data packet at a root node of a classification tree;
successively passing the data packet to each child of a first tree
5 level until a first child of the first tree level of the classification tree indicates a satisfaction of a node-criteria packet matching function of said first child, and the first child forming said data packet into a matched packet; and

10 repeating the step of passing and forming for a next tree level until no first child of said next level at a succeeding next level indicates satisfaction of the node-criteria packet matching function of said first child of said next level.

Claim 2 (original) A method as recited in claim 1, wherein the step of passing includes executing a set of code which returns a status indication.

Claim 3 (original) A method as recited in claim 1, wherein the step of forming includes the first child specifying a set of code to be run subsequently.

Claim 4 (original) A method as recited in claim 3, wherein the step of specifying includes specifying the set of code to be run following satisfaction.

Claim 5 (original) A method as recited in claim 1, further comprising dynamically adding at least one node in at least one level of the classification tree.

Claim 6 (original) A method as recited in claim 5, wherein said at least one new child node is a Real Audio node.

Claim 7 (original) A method for classifying a packet, said method comprising suspending a packet classification process in progress for said packet; and obtaining external information employed in said classifying.

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Claim 8 (original) A method in claim 7, wherein the step of obtaining includes augmenting a node-criteria of a node in a classification tree with external information.

Claim 9 (original) A method as in claim 8, wherein the external information includes identification of the originator of said packet.

Claim 10 (original) A method as in claim 8, wherein the external information includes authentication of an originator of said packet.

Claim 11 (original) A method as recited in claim 7, wherein the classification process is an extendible classifier process.

Claim 12 (original) A method as recited in claim 1, further comprising the step of parsing said matched packet and generating relevant information.

Claim 13 (original) A method as recited in claim 1, further comprising the step of transforming said matched packet into a transformed packet.

Claim 14 (original) A method as recited in claim 1, further comprising associating the packet with a last first child indicating satisfaction.

Claim 15 (original) A method as recited in claim 14, further comprising executing a set of code in accordance with said last first child.

Claim 16 (original) A method as recited in claim 1, further comprising determining a disposition of the data packet.

Claim 17 (original) A method for determining disposition of a packet received at a child node, said method comprising:

passing said packet and a first disposition of said packet to an external process; and

5 said external process augmenting the packet disposition by employing

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a process specific means; and returning the augmented packet and an augmented disposition to the child node.

Claim 18 (original) A method as recited in claim 17, further comprising suspending a disposition process in progress for said packet.

Claim 19 (original) A method as in claim 18, wherein the augmented disposition includes identification of an originator of said packet.

Claim 20 (original) A method as in claim 18 wherein the augmented disposition includes authentication of an originator of said packet.

Claim 21 (original) A method as recited in claim 18, wherein the disposition is employed for policy enforcement.

Claim 22 (original) A method as recited in claim 16, further comprising employing the classification process as a firewall.

Claim 23 (previously amended) A method as recited in claim 1, further comprising employing the classification process for dynamic application level classification.

Claim 24 (original) A method as recited in claim 23, further comprising employing the classification process for policy enforcement.

Claim 25 (original) A method as recited in claim 23, further comprising employing the classification process for rate limiting.

Claim 26 (original) A method as recited in claim 23, further comprising employing the classification process for load balancing.

Claim 27 (original) A method as recited in claim 1, further comprising employing the classification process to shape traffic.

Claim 28 (original) An apparatus to classify a data packet, the apparatus comprising:

a network interface device to receive the data packet from the

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5 physical network and pass the data packet to the root node of a
classification tree, and the reverse, to receive the data packet from the
root node and send the data packet to the physical network;

10 a packet module to successively pass the packet from child node to
child node at a next tree level until a first child node of the next tree
level of the classification tree which indicates a satisfaction of a node-
criteria of the first child node, and to form the data packet into a
matched packet until no first child node of at a succeeding next level
indicates satisfaction of the first node-criteria of the first child node
of the succeeding next level.

Claim 29 (original) An apparatus as recited in claim 28, wherein
a portion of the apparatus is implemented as an accelerator chip.

Claim 30 (original) An apparatus as recited in claim 28, wherein
the apparatus is employed for application level classification.

Claim 31 (original) An apparatus as recited in claim 28, wherein
the apparatus is employed as a firewall.

Claim 32 (original) An apparatus as recited in claim 28, wherein
the apparatus is employed as a border server.

Claim 33 (original) A method as recited in claim 2, wherein the
status indication is of the pm_t type.

5 Claim 34 (original) An article of manufacture comprising a
computer usable medium having computer readable program code means
embodied therein for causing classification of a data packet, the computer
readable program code means in said article of manufacture comprising
computer readable program code means for causing a computer to effect the
steps of claim 1.

5 Claim 35 (original) An article of manufacture as recited in
claim 34, the computer readable program code means in said article of
manufacture further comprising computer readable program code means for
causing a computer to effect dynamically adding at least one node in at
least one level of the classification tree.

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Claim 36 (original) An article of manufacture comprising a computer usable medium having computer readable program code means embodied therein for causing classification of a data packet, the computer readable program code means in said article of manufacture comprising

5. computer readable program code means for causing a computer to effect the steps of claim 8.

Claim 37 (original) A computer program product comprising a computer usable medium having computer readable program code means embodied therein for causing a determination of a disposition of a packet, the computer readable program code means in said computer program product

5. comprising computer readable program code means for causing a computer to effect the steps of claim 18.

Claim 38 (original) An apparatus for classifying a data packet, the apparatus comprising:

means for receiving the data packet at a root node of a classification tree;

5. means for successively passing the data packet to each child of a first tree level until a first child node of the first tree level of the classification tree indicates a satisfaction of a node-criteria of said first child node, and the first child node forming said data packet into a matched packet; and

10. means for repeating the steps of passing and forming for a next tree level until no first child node of said next tree level at a succeeding next level indicates satisfaction of the node-criteria of said first child node of said succeeding next level.

Claim 39 (original) An apparatus for determining disposition of a packet received at a child node, said apparatus comprising:

an interrupt context of a control program, said child node existing within the interrupt context;

an external process outside of the interrupt context of the control program;

means for passing said packet and a first disposition of said packet to the external process, said external process to augment the packet disposition by employing a process specific means and to return an

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augmented packet with an augmented disposition to the child node; and
said interrupt context including means for receiving said augmented
packet and said augmented disposition from said external process.